

CLAIMS

What is claimed is:

- 1 1. An apparatus comprising:
2 a cache of a current peer in a current ring at a current level to store information of
3 ring peers within the current ring, the current ring being part of an hierarchical ring
4 structure of peer-to-peer (P2P) nodes, the hierarchical ring structure having at least one of
5 a lower level and an upper level; and
6 a peer locator coupled to the cache to locate a target peer in the cache in response to
7 a request.

- 1 2. The apparatus of claim 1, further comprising:
2 a peer interface coupled to the peer locator to interface to at least one of a first
3 lower peer in a first lower ring at the lower level and a first upper peer in a first upper ring
4 at the upper level, the peer interface to forward the request to search the target peer to at
5 least one of the first lower peer and the first upper peer when the target peer is not located
6 in the cache.

- 1 3. The apparatus of claim 2, wherein the peer interface comprises:
2 a lower interface to interface to at least one of the first lower peer and a second
3 lower peer in a second lower ring at the lower level, the lower interface to forward the
4 request to at least one of the first and second lower peers to search the target peer when the
5 target peer is not located in the cache.

- 1 4. The apparatus of claim 3, wherein the lower interface to receive the request
2 from at least one of the first and second lower peers to search the target peer.

- 1 5. The apparatus of claim 2, wherein the peer interface comprises:
2 an upper interface to interface to at least one of the first upper peer and a second
3 upper peer in a second upper ring at the upper level, the upper interface to forward the

4 request to at least one of the first and second upper peers to search the target peer when the
5 target peer is not located in the cache.

1 6. The apparatus of claim 5, wherein the upper interface to receive the request
2 from at least one of the first and second upper peers to search the target peer.

1 7. The apparatus of claim 2, wherein the cache stores information of at least
2 one of the first and second lower peers.

1 8. The apparatus of claim 2, further comprising:
2 a registrar to process registration of at least one of the current peer to the first upper
3 peer and the first lower peer to the current peer, the registration including the information
4 on one of the current peer, the first upper peer, and the first lower peer.

1 9. The apparatus of claim 1, wherein the peer locator comprises:
2 an information retriever to retrieve the information of the target peer if the target
3 peer is located in the cache.

1 10. The apparatus of claim 1, wherein the information includes an address of
2 the target peer.

1 11. A method comprises:
2 storing information of ring peers within a current ring at a current level in a cache
3 of a current peer in the current ring, the current ring being part of an hierarchical ring
4 structure of peer-to-peer (P2P) nodes, the hierarchical ring structure having at least one of
5 a lower level and an upper level; and
6 locating a target peer in the cache in response to a request.

1 12. The method of claim 11, further comprising:
2 interfacing to at least one of a first lower peer in a first lower ring at the lower level
3 and a first upper peer in a first upper ring at the upper level; and

4 forwarding the request to search the target peer to at least one of the first lower peer
5 and the first upper peer when the target peer is not located in the cache.

1 13. The method of claim 12, wherein the interfacing comprises:
2 interfacing to at least one of the first lower peer and a second lower peer in a
3 second lower ring at the first lower level; and
4 forwarding the request to at least one of the first and second lower peers to search
5 the target peer when the target peer is not located in the cache.

1 14. The method of claim 13, wherein interfacing to at least one of the first
2 lower peer and a second lower peer comprises:
3 receiving the request from at least one of the first and second lower peers to search
4 the target peer.

1 15. The method of claim 12, wherein interfacing comprises:
2 interfacing to at least one of the first upper peer and a second upper peer in a
3 second upper ring at the upper level; and
4 forwarding the request to at least one of the first and second upper peers to search
5 the target peer when the target peer is not located in the cache.

1 16. The method of claim 15, wherein interfacing to at least one of the first
2 upper peer and a second upper peer comprises:
3 receiving the request from at least one of the first and second upper peers to search
4 the target peer.

1 17. The method of claim 12, wherein storing the information comprises:
2 storing the information of at least one of the first and second lower peers.

1 18. The method of claim 12, further comprising:
2 processing registration of at least one of the current peer to the first upper peer and
3 the first lower peer to the current peer, the registration including the information on one of
4 the current peer, the first upper peer, and the first lower peer.

1 19. The method of claim 11, wherein locating comprises:
2 retrieving the information of the target peer if the target peer is located in the cache.

1 20. The method of claim 11, wherein storing the information comprises:
2 storing an address of the target peer.

1 21. A system comprising:
2 a requesting peer to generate a request to search a target peer; and
3 a current peer in a current ring at a current level, the current ring being connected to
4 the requesting peer in an hierarchical ring structure of peer-to-peer (P2P) nodes, the
5 hierarchical ring structure having at least one of a lower level and a upper level, the current
6 peer including a P2P subsystem, the P2P subsystem comprising:
7 a cache to store information of ring peers within the current ring, and
8 a peer locator coupled to the cache to locate the target peer in the cache in
9 response to the request.

1 22. The system of claim 21, wherein the P2P subsystem further comprising:
2 a peer interface coupled to the peer locator to interface to at least one of a first
3 lower peer in a first lower ring at the lower level and a first upper peer in a first upper ring
4 at the upper level, the peer interface to forward the request to search the target peer to at
5 least one of the first lower peer and the first upper peer when the target peer is not located
6 in the cache.

1 23. The system of claim 22, wherein the peer interface comprises:
2 a lower interface to interface to at least one of the first lower peer and a second
3 lower peer in a second lower ring at the lower level, the lower interface to forward the
4 request to at least one of the first and second lower peers to search the target peer when the
5 target peer is not located in the cache.

1 24. The system of claim 23, wherein the lower interface to receive the request
2 from at least one of the first and second lower peers to search the target peer.

1 25. The system of claim 22, wherein the peer interface comprises:
2 an upper interface to interface to at least one of the first upper peer and a second
3 peer in a second upper ring at the upper level, the upper interface to forward the request to
4 at least one of the first and second upper peers to search the target peer when the target
5 peer is not located in the cache.

1 26. The system of claim 25, wherein the upper interface to receive the request
2 from at least one of the first and second upper peers to search the target peer.

1 27. The system of claim 22, wherein the cache stores information of at least one
2 of the first and second lower peers.

1 28. The system of claim 22, wherein the P2P subsystem further comprising:
2 a registrar to process registration of at least one of the current peer to the first upper
3 peer and the first lower peer to the current peer, the registration including the information
4 on one of the current peer, the first upper peer, and the first lower peer.

1 29. The system of claim 21, wherein the peer locator comprises:
2 an information retriever to retrieve the information of the target peer if the target
3 peer is located in the cache.

1 30. The system of claim 21, wherein the information includes an address of the
2 target peer.